

1      CLAIMS:

2      1. A semiconductor processing method of forming a conductive  
3      projection comprising:

4                providing a substrate having a surface area over which a  
5      conductive projection is to be formed;

6                forming a conductive projection over the surface area, the  
7      projection having an upper surface and a side surface joined therewith  
8      defining a corner region; and

9                beveling the corner region of the conductive projection.

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11      2. The semiconductor processing method of claim 1, wherein  
12      the surface area comprises a diffusion region, and further comprising  
13      after the beveling of the corner region, forming conductive material over  
14      the conductive projection and in electrical communication with the  
15      diffusion region.

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17      3. The semiconductor processing method of claim 1, wherein  
18      the beveling of the corner region comprises facet etching the conductive  
19      projection.

1       4. The semiconductor processing method of claim 1, wherein  
2       the beveling of the corner region comprises:

3               unevenly doping material of the conductive projection proximate  
4       the upper and side surfaces thereof; and

5               etching material of the conductive projection containing greater  
6       concentrations of dopant at a greater rate than material of the  
7       conductive projection containing lower concentrations of dopant.

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9       5. A semiconductor processing method of forming a conductive  
10      projection comprising:

11               forming a conductive line proximate a substrate node location with  
12       which electrical communication is desired;

13               forming a conductive projection over the node location, the  
14       projection having an upper surface and a side surface joined therewith  
15       defining a corner region, at least a portion of the corner region being  
16       disposed elevationally over the conductive line; and

17               beveling the corner region portion.

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19       6. The semiconductor processing method of claim 5, wherein  
20       the beveling of the corner region portion comprises facet etching the  
21       corner region portion.

1           7. The semiconductor processing method of claim 5, wherein  
2         the beveling of the corner region comprises:

3                 unevenly doping material of the conductive projection proximate  
4         the upper and side surfaces thereof; and

5                 etching material of the conductive projection containing greater  
6         concentrations of dopant at a greater rate than material of the  
7         conductive projection containing lower concentrations of dopant.

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9           8. A semiconductor processing method of forming a conductive  
10      projection comprising:

11                 forming a pair of spaced-apart, insulated conductive lines over a  
12      substrate, the conductive lines defining a node location therebetween  
13      with which electrical communication is desired;

14                 forming insulative material over the node location and between the  
15      conductive lines;

16                 forming an opening through the insulative material and between  
17      the lines to proximate the node location;

18                 forming conductive material within the opening over the node  
19      location, the conductive material having side surfaces which project away  
20      from the node location and terminate proximate an upper surface, the  
21      side surfaces and upper surface defining at least one corner region; and

22                 beveling the corner region.

1           9. The semiconductor processing method of claim 8, wherein  
2         the forming of the insulative material comprises forming first and second  
3         layers of insulative material over the node location.

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5           10. The semiconductor processing method of claim 9 further  
6         comprising planarizing the first layer of insulative material prior to  
7         forming the second layer of insulative material.

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9           11. The semiconductor processing method of claim 9 further  
10         comprising removing the first and second layers of insulative material  
11         prior to beveling the corner region.

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13           12. A method of forming DRAM circuitry comprising:  
14             forming a conductive plug over a substrate node location between  
15         a pair of conductive lines and with which electrical communication with  
16         a bit line is desired, the conductive plug having an uppermost surface;  
17         and

18             unevenly removing material of the conductive plug to define a  
19         second uppermost surface at least a portion of which is disposed  
20         elevationally higher than the conductive lines.

1           13. The method of claim 12, wherein the unevenly removing  
2           material of the conductive plug comprises facet etching the conductive  
3           plug.

5           14. The method of claim 12, wherein the unevenly removing  
6           material of the conductive plug comprises:

7           unevenly doping material of the conductive plug with dopant  
8           proximate the uppermost surface, outermost side portions of the plug  
9           having greater concentrations of dopant than plug material therebetween;  
10          and

11         etching material of the conductive plug containing greater  
12         concentrations of dopant at a greater rate than material of the  
13         conductive plug containing lower concentrations of dopant.

15         15. The method of claim 14, wherein the unevenly doping  
16         material of the conductive plug comprises conducting an angled ion  
17         implant of the dopant.

19         16. The method of claim 12, wherein the forming of the  
20         conductive plug comprises forming the plug to have a central region and  
21         a corner region joined therewith, and the unevenly removing material  
22         of the conductive plug comprises removing more material from the  
23         corner region than from the central region.

1           17. The method of claim 12, wherein the forming of the  
2 conductive plug comprises:

3           forming insulative material over the node location, the insulative  
4 material having a generally planar upper surface;

5           forming a contact opening through the insulative material and  
6 exposing a portion of the node location;

7           filling the contact opening with conductive material; and

8           planarizing the conductive material relative to the insulative  
9 material upper surface.

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11           18. The method of claim 17 further comprising removing the  
12 insulative material prior to removing the material of the conductive plug  
13 to define the second uppermost surface.

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15           19. The method of claim 18, wherein the removing of material  
16 of the conductive plug comprises facet etching the conductive plug.

1           20. The method of claim 18, wherein the removing of material  
2         of the conductive plug comprises:

3           unevenly doping material of the conductive plug with dopant  
4         proximate the uppermost surface, outermost side portions of the plug  
5         having greater concentrations of dopant than plug material therebetween;  
6         and

7           etching material of the conductive plug containing greater  
8         concentrations of dopant at a greater rate than material of the  
9         conductive plug containing lower concentrations of dopant.

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11           21. A method of increasing alignment tolerances between bit line  
12         contact material and storage capacitors in a DRAM comprising beveling  
13         a conductive plug formed over a diffusion region with which a bit line  
14         is to electrically communicate.

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16           22. A method forming DRAM circuitry comprising:

17           forming a conductive plug over a substrate node location between  
18         a pair of conductive lines and with which electrical communication with  
19         a bit line is desired, the conductive plug having an uppermost surface;  
20         and

21           etching material of the conductive plug to define a second  
22         uppermost surface which is generally non-planar and at least a portion  
23         of which is disposed elevationally higher than the conductive lines.

1           23. The method of claim 22, wherein the etching of the  
2 material of the conductive plug comprises facet etching the conductive  
3 plug.

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5           24. The method of claim 22, wherein the etching of the  
6 material of the conductive plug comprises:

7                 unevenly doping material of the conductive plug with dopant  
8 proximate the uppermost surface, outermost side portions of the plug  
9 having greater concentrations of dopant than plug material therebetween;  
10 and

11                 etching material of the conductive plug containing greater  
12 concentrations of dopant at a greater rate than material of the  
13 conductive plug containing lower concentrations of dopant.

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15           25. The method of claim 22, wherein the forming of the  
16 conductive plug comprises:

17                 forming insulative material over the node location;

18                 forming a contact opening through the insulative material and  
19 exposing a portion of the node location;

20                 forming conductive material within the contact opening; and

21                 removing said insulative material prior to etching material of the  
22 conductive plug.

1           26. The method of claim 25 further comprising planarizing the  
2           conductive material.

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4           27. The method of claim 25, wherein the forming of the  
5           insulative material over the node location comprises forming first and  
6           second layers of insulative material over the node location.

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8           28. The method of claim 27 further comprising planarizing the  
9           first insulative layer prior to forming the second insulative layer.

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11          29. The method of claim 27, wherein the forming of the second  
12          layer of insulative material comprises forming said second layer to have  
13          a generally planar surface over the node location, and further  
14          comprising after the forming of the conductive material, planarizing said  
15          conductive material to be substantially coplanar with the second layer  
16          surface.

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18          30. The method of claim 29, wherein the etching of the  
19          material of the conductive plug comprises facet etching the conductive  
20          plug.

1           31. The method of claim 29, wherein the etching of the  
2 material of the conductive plug comprises:

3           unevenly doping material of the conductive plug with dopant  
4 proximate the uppermost surface, outermost side portions of the plug  
5 having greater concentrations of dopant than plug material therebetween;  
6 and

7           etching material of the conductive plug containing greater  
8 concentrations of dopant at a greater rate than material of the  
9 conductive plug containing lower concentrations of dopant.

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11           32. A method of forming DRAM circuitry comprising:

12           forming a conductive plug over a substrate node location between  
13 a pair of conductive lines and with which electrical communication with  
14 a bit line is desired, the conductive plug having an uppermost surface  
15 which is defined in part by a corner region;

16           providing impurity into the corner region; and

17           etching material of the conductive plug containing greater  
18 concentrations of the impurity at a greater rate than material of the  
19 conductive plug containing lower concentrations of the impurity.

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21           33. The method of claim 32, wherein the providing of the  
22 impurity comprises conducting an angled ion implant of the impurity.

1           34. The method of claim 32, wherein the forming of the  
2 conductive plug comprises forming the plug to project away from the  
3 node location a distance which is further than a distance one of the  
4 conductive lines projects away from the node location.

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6           35. The method of claim 32, wherein the forming of the  
7 conductive plug comprises forming the plug's uppermost surface  
8 elevationally over both conductive lines.

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10          36. The method of claim 32, wherein the forming of the  
11 conductive plug comprises:

12                 forming an insulative material over the node location, at least a  
13 portion of the insulative material having a generally planar surface;

14                 forming a contact opening through the insulative material and  
15 exposing a portion of the node location;

16                 forming conductive material within the contact opening and over  
17 the insulative material; and

18                 planarizing the conductive material sufficient to provide the  
19 uppermost plug surface to be generally coplanar with the generally  
20 planar surface portion of the insulative material.

1           37. The method of claim 36 further comprising removing the  
2 insulative material prior to the etching of the material of the conductive  
3 plug.

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5           38. The method of claim 36 further comprising removing the  
6 insulative material prior to the providing of the impurity into the corner  
7 region.

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9           39. A method of forming DRAM circuitry comprising:  
10           forming conductive material over a substrate node location with  
11 which electrical communication with a bit line is desired, the node  
12 location being at least partially defined between a pair of conductive  
13 lines, the conductive material extending away from the substrate and  
14 having an uppermost surface disposed elevationally higher than the word  
15 lines, the conductive material having a first alignment tolerance relative  
16 to a substrate location in which a capacitor is to be formed; and  
17           unevenly removing material of the conductive material and defining  
18 a second uppermost surface which is generally non-planar, at least a  
19 portion of which is disposed elevationally higher than the word lines,  
20 the conductive material having a second alignment tolerance relative to  
21 the substrate location which is greater than the first alignment tolerance.

1           40. The method of claim 39, wherein the unevenly removing  
2 material of the conductive material comprises beveling the conductive  
3 material.

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5           41. The method of claim 39, wherein the unevenly removing  
6 material of the conductive material comprises facet etching the  
7 conductive material.

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9           42. The method of claim 39, wherein the unevenly removing  
10 material of the conductive material comprises:

11           unevenly doping material of the conductive material proximate the  
12 uppermost surface thereof, outermost side portions of the plug having  
13 greater concentrations of dopant than plug material therebetween; and

14           etching material of the conductive material containing greater  
15 concentrations of dopant at a greater rate than material of the  
16 conductive material containing lower concentrations of dopant.

1       43. The method of claim 39, wherein the forming of the  
2 conductive material comprises:

3              forming insulative material over the node location;

4              forming a contact opening through the insulative material and  
5 exposing a portion of the node location;

6              forming conductive material within the contact opening and over  
7 the insulative material; and

8              planarizing conductive material disposed over the node location to  
9 provide the uppermost surface.

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11       44. The method of claim 43 further comprising removing the  
12 insulative material before unevenly removing the material of the  
13 conductive material.

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15       45. The method of claim 44, wherein the removing of the  
16 material of the conductive material comprises facet etching the  
17 conductive material.

1           46. The method of claim 44, wherein the removing of the  
2 material of the conductive material comprises:

3                 unevenly doping material of the conductive material proximate the  
4 uppermost surface thereof, outermost side portions of the plug having  
5 greater concentrations of dopant than plug material therebetween; and

6                 etching material of the conductive material containing greater  
7 concentrations of dopant at a greater rate than material of the  
8 conductive material containing lower concentrations of dopant.

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